Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (*Currently amended*) Method for the measurement of laser desorption mass spectra with high ~~throughput~~ operational stability in a time-of-flight mass spectrometer with delayed ion acceleration, the method comprising the steps of:
(a) providing a time-of-flight mass spectrometer with a pulse generator that generates voltage pulses, in response to a pulse trigger signal, that are delivered to an electrode of the spectrometer for the control of the delayed ion acceleration;
(b) providing a pulse laser system that generates a laser pulse in response to a laser trigger signal, and that outputs a pulse trigger signal to the pulse generator once a laser light pulse is generated;
(c) generating a clock signal having a frequency corresponding to a frequency of spectrum acquisition or a multiple thereof; and
(d) directing the clock signal with a switch to either to the pulse laser system or to the pulse generator, the clock signal being directed to the pulse generator as a pulse trigger signal during waiting periods without spectrum acquisition, and being directed to the pulse laser system as a laser trigger signal at times of spectrum acquisition ~~wherein the periodic sequence of voltage pulses, in principle only necessary during a spectrum measurement, is constantly generated by a clock pulse, regardless whether a spectrum is acquired or not~~.

2. (*Canceled*)

3. (*Original*) Method as in Claim 1, wherein a uniform resolving power is maintained over the entire acquisition range of the mass spectrum through time-shaping the delayed acceleration voltage pulse in the ion source.

4. (*Currently amended*) Method as in Claim 1,further comprising using a precursor ion selector and a post-acceleration unit for the acquisition of daughter ion spectra, wherein the pulse generator controls a complete sequence of voltage pulses for the delayed acceleration electrode, ~~periodic sequence of voltage pulses in~~ the precursor ion selector and ~~in the~~ the post-acceleration unit ~~also operate constantly synchronous to the basic clock frequency~~.

5. (*Currently amended*) Method as in Claim 4, wherein a delayed acceleration voltage pulse ~~in the ion source~~ from the pulse generator provides time-focusing of the ions of one particular mass precisely in the precursor ion selector, and wherein time-focusing of the daughter ions at the ion detector ~~the location of the time-focus~~ is made independent of the mass by time-shaping the delayed acceleration voltage pulse.

6. (*Canceled*)

7. (*Currently amended*) Method as in Claim 4, wherein first the primary spectra of a large number of samples on a sample support are measured without using the precursor ion selector and the post-acceleration unit, the primary spectra from the samples being passed to an expert system that determines the necessity for acquisition daughter ion spectra and determines the associated precursor ions, and wherein the mass spectrometer is then readjusted for the measurement of daughter ion spectra, using the precursor ion selector and the post-acceleration unit, and measures the daughter ion spectra from those samples where it has been found to be necessary.

8. (*Currently amended*) Method as in Claim 5 ~~Claims 3~~, wherein the time-shaping of the acceleration voltage pulses follows a simple exponential function approaching a limit value.

9. (*Original*) Method as in Claim 8, wherein the time-shaped acceleration voltage pulse is applied to a central electrode positioned in front of a base electrode at chassis potential.

10. (*Original*) Method as in Claim 8, wherein the time-shaping of the acceleration voltage pulse is created by simple R-C networks.

11. (*Currently amended*) Method as in Claim 1, wherein only every second, third, or nth period of clock ~~the sequence of voltage~~ pulses is used to trigger the laser and thus to acquire a spectrum, whereas the remaining clock pulses trigger the pulse generator.

12. (*Currently amended*) Method for the measurement of daughter ion spectra, the method comprising:

providing ~~in~~ a reflector time-of-flight mass spectrometer ~~with~~ having a precursor ion selector between ~~the~~ an ion source and a reflector;

performing, ~~with~~ pulsed ionization of analyte substances on a sample support by laser desorption and ~~with~~ supplying a time-shaped acceleration voltage pulse, switched on after a delay, to an acceleration electrode of the spectrometer wherein ~~the~~ a time-focus for ions of ~~one~~ a first mass created by the delay period and the accelerating field strength is located in the precursor ion selector~~,~~; and

~~wherein by rising~~ raising over time the voltage of the acceleration voltage pulse, such that ~~the~~ time-focus locations for ions of different masses are located at the same point, irrespective of the mass.

13. (*Original*) Method as in Claim 12, wherein the voltage rise with time follows a simple exponential function approaching a limit.

14. (*Original*) Method as in Claim 12, wherein the ions, having passed through the precursor ion selector, are further accelerated in a post-acceleration unit.

15. (*Original*) Method as in Claim 14, wherein the ions are also accelerated in the post-acceleration unit by a time-shaped acceleration voltage pulse.

16. (*Currently amended*) Method as in Claim 12, wherein, in order to achieve and maintain electrical and thermal equilibrium in the supply units, ~~the~~ voltage pulse periods in the ion source~~, and, if applicable, in the precursor ion selector and in the post-acceleration unit~~ are constantly repeated at a basic frequency, irrespective of whether a spectrum will be measured in the relevant period or not.

17. (*Currently amended*) Method as in Claim 12, wherein selection of the precursor ions for the acquisition of daughter ion spectra is achieved by changing only the phase between the voltage periods in the ion source~~,~~ and the precursor ion selector ~~and, if applicable, in the post-acceleration unit~~.

18. (*Currently amended*) Method as in Claim 16, wherein not every period of the basic frequency is used for ionization and for acquisition of a spectrum.

19. (*Currently amended*) Method as in Claim 12, wherein ~~the~~ a deflecting field in the precursor ion selector is set to zero in order to permit passage of the desired ions, and after an appropriate switching time interval, is switched to the opposite field polarity.

20. (*Original*) Method as in Claim 19, wherein the length of the switching time interval is chosen to be inversely proportional to the velocity of the desired ions.

21. (*Currently amended*) A time-of-flight mass spectrometer in which the samples to be analyzed are ionized by laser desorption, comprising:

a pulse ~~with an electronic~~ generator for generating an ~~a~~ acceleration voltage pulse;

a triggerable laser system connected to the pulse generator that, in response to the generation of a laser light pulse, initiates the generation of an acceleration voltage pulse from the pulse generator; and

~~delayed in relation to the laser pulse, and with~~ a clock ~~generator~~ for triggering the laser during spectrum ~~the~~ acquisition periods, wherein the clock output ~~generator~~ can be switched between triggering the laser, for spectrum acquisition, and directly triggering the pulse generator, for periods where no spectra are acquired ~~electronic generator for the delayed acceleration pulse~~.

22. (*Currently amended*) Time-of-flight mass spectrometer as in Claim 21, wherein ~~a reflector and~~ a precursor ion selector ~~are~~ is provided, and wherein ~~where~~ the pulse generator generates a pulse that provides delayed triggering of the precursor ion selector ~~may also be switched between triggering by the laser pulse and direct triggering by the clock generator~~.

23. (*Currently amended*) Time-of-flight mass spectrometer as in Claim 21, wherein a post-acceleration unit for daughter ions is provided ~~for the ions~~, and wherein the pulse generator generates a pulse that provides delayed triggering of the post-acceleration unit ~~is also be switched between triggering by the laser pulse and direct triggering by the clock generator~~.

24. (*Canceled*)

Amendments to the Drawings

The attached sheet of drawings includes changes to Figures 1 and 2. This sheet, which includes Figures 1, 2 and 3, replaces the original drawing sheet including Figures 1, 2 and 3.

Attachment: replacement sheet(s)